

Student: _____
Date: _____Instructor: Alfredo Alvarez
Course: Math 1314 Sullivan CoreqAssignment:
finalm1314COC037sulllljjRZZ37X

1. Simplify by factoring.

$\sqrt{50}$

Answer: $5\sqrt{2}$

ID: Quick Check R.6.25

$$\sqrt{50} =$$

$$\sqrt{25 \cdot 2} = \text{rewrite}$$

$$\sqrt{25} \sqrt{2} = 5\sqrt{2}$$

$\sqrt{50} = \boxed{}$

(Type an exact answer, using radicals as needed.)

Primes 2, 3, 5, 7, 11, 13

$$50 = 2 \cdot 25$$

$$50 = 2 \cdot 5 \cdot 5$$

2. Use the FOIL method to find the product.

$(4x + 9)(5x - 1)$

$(4x + 9)(5x - 1) = \boxed{}$ (Simplify your answer.)

Answer: $20x^2 + 41x - 9$

ID: Quick Check R.10.10

$$(4x + 9)(5x - 1) =$$

$$20x^2 - 4x + 45x - 9 =$$

$$20x^2 + 41x - 9 =$$

3. Find the product using the difference of two squares formula.

$(8x + 5)(8x - 5)$

$(8x + 5)(8x - 5) = \boxed{}$

Answer: $64x^2 - 25$

ID: Quick Check R.10.16

$$(8x + 5)(8x - 5) =$$

$$64x^2 - 40x + 40x - 25 =$$

$$64x^2 - 25 =$$

4. Multiply using the rule for the square of a binomial.

$(x - 3)^2$

$(x - 3)^2 = \boxed{}$

Answer: $x^2 - 6x + 9$

ID: Quick Check R.10.21

$$(x - 3)^2 =$$

$$(x - 3)(x - 3) =$$

$$x^2 - 3x - 3x + 9 =$$

$$x^2 - 6x + 9 =$$

RABBIT



5. Find the product.

$(b-2)(b-1)(b-4)$

$(b-2)(b-1)(b-4) =$

Answer: $b^3 - 7b^2 + 14b - 8$

$(b-2)(b-1)(b-4) =$
 $(b-2)(b^2 - 4b - 1b + 4) =$
 $(b-2)(b^2 - 5b + 4) =$
 $b^3 - 5b^2 + 4b - 2b^2 + 10b - 8 =$
 $b^3 - 7b^2 + 14b - 8 =$ ✓✓

ID: R.10.61

6. Simplify the expression.

$(y+2)^3$

$(y+2)^3 =$

Answer: $y^3 + 6y^2 + 12y + 8$

$(y+2)^3 =$
 $(y+2)(y+2)(y+2) =$
 $(y+2)(y^2 + 2y + 2y + 4) =$
 $(y+2)(y^2 + 4y + 4) =$
 $y^3 + 4y^2 + 4y + 2y^2 + 8y + 8 =$
 $y^3 + 6y^2 + 12y + 8 =$ ✓✓

ID: R.10.93

7. Factor the polynomial completely. If the polynomial cannot be factored, say it is prime

$-2x^3 + 6x^2 - 4x$

$-2x^3 + 6x^2 - 4x =$
 $-2x(x^2 - 3x + 2) =$ ✓✓
 $-2x(x-1)(x-2) =$ ✓✓

Select the correct choice below and, if necessary, fill in the answer box to complete your choice.

A. $-2x^3 + 6x^2 - 4x =$ (Type your answer in factored form.)

B. The polynomial $-2x^3 + 6x^2 - 4x$ is prime.

Answer: A. $-2x^3 + 6x^2 - 4x =$ (Type your answer in factored form.)

ID: Quick Check PF.3.14

8. Factor the polynomial completely. If the polynomial cannot be factored, say it is prime.

$-3p^2 - 21p - 36$

$-3p^2 - 21p - 36 =$

Select the correct choice below and, if necessary, fill in the answer box to complete your choice.

A. $-3p^2 - 21p - 36 =$ (Type your answer in factored form.)

B. The polynomial $-3p^2 - 21p - 36$ is prime.

$-3(p^2 + 7p + 12) =$
 $-3(p+3)(p+4) =$ ✓✓

Answer: A. $-3p^2 - 21p - 36 =$ (Type your answer in factored form.)

ID: Quick Check PF.3.15

9. Solve the equation by factoring.

$$z^2 + 4z - 5 = 0$$

What is the solution set?

(Use a comma to separate answers as needed.)

Answer: -5, 1

$z^2 + 4z - 5 = 0$
 $(z - 1)(z + 5) = 0$
 set $z - 1 = 0$ OR $z + 5 = 0$
 $z - 1 + 1 = 0 + 1$ OR $z + 5 - 5 = 0 - 5$
 $z = 1$ OR $z = -5$

Possible 1.5

ID: PF.4.31

10. Solve the equation.

$$q^2 + 7q = 8$$

The solution set is .

(Simplify your answer. Type an integer or a fraction. Use a comma to separate answers as needed.)

Answer: 1, -8

$q^2 + 7q = 8$
 $q^2 + 7q - 8 = 0$ rewrite
 $(q - 1)(q + 8) = 0$
 set $q - 1 = 0$ OR $q + 8 = 0$
 $q - 1 + 1 = 0 + 1$ OR $q + 8 - 8 = 0 - 8$
 $q = 1$ OR $q = -8$

Possible 1.8, 2.4

ID: PF.4.33

11. Solve the equation.

$$7x^3 + x^2 - 28x - 4 = 0$$

The solution set is .

(Simplify your answer. Type an integer or a simplified fraction. Use a comma to separate answers as needed.)

Answer: $-\frac{1}{7}, -2, 2$

Use Synthetic Division
 $(-2) \begin{array}{r|rrrr} 7 & 1 & -28 & -4 & \\ & & 14 & 30 & 14 & \\ \hline & 7 & 15 & 2 & 0 \text{ rem} & \end{array}$
 $7x + 1 = 0 \rightarrow 7x = -1 \rightarrow x = -\frac{1}{7}$
 $7x + 1 - 1 = 0 - 1 \rightarrow 7x = -1$

Use Synthetic Division
 $(-\frac{1}{7}) \begin{array}{r|rrrr} 7 & 1 & 15 & 2 & \\ & & -1 & -2 & \\ \hline & 1 & 14 & 0 & \\ & & 1 & 1 & \\ \hline & 1 & 15 & 2 & \\ & & 1 & 1 & \\ \hline & 1 & 16 & 3 & \\ & & 1 & 1 & \\ \hline & 1 & 17 & 4 & \\ & & 1 & 1 & \\ \hline & 1 & 18 & 5 & \\ & & 1 & 1 & \\ \hline & 1 & 19 & 6 & \\ & & 1 & 1 & \\ \hline & 1 & 20 & 7 & \\ & & 1 & 1 & \\ \hline & 1 & 21 & 8 & \\ & & 1 & 1 & \\ \hline & 1 & 22 & 9 & \\ & & 1 & 1 & \\ \hline & 1 & 23 & 10 & \\ & & 1 & 1 & \\ \hline & 1 & 24 & 11 & \\ & & 1 & 1 & \\ \hline & 1 & 25 & 12 & \\ & & 1 & 1 & \\ \hline & 1 & 26 & 13 & \\ & & 1 & 1 & \\ \hline & 1 & 27 & 14 & \\ & & 1 & 1 & \\ \hline & 1 & 28 & 15 & \\ & & 1 & 1 & \\ \hline & 1 & 29 & 16 & \\ & & 1 & 1 & \\ \hline & 1 & 30 & 17 & \\ & & 1 & 1 & \\ \hline & 1 & 31 & 18 & \\ & & 1 & 1 & \\ \hline & 1 & 32 & 19 & \\ & & 1 & 1 & \\ \hline & 1 & 33 & 20 & \\ & & 1 & 1 & \\ \hline & 1 & 34 & 21 & \\ & & 1 & 1 & \\ \hline & 1 & 35 & 22 & \\ & & 1 & 1 & \\ \hline & 1 & 36 & 23 & \\ & & 1 & 1 & \\ \hline & 1 & 37 & 24 & \\ & & 1 & 1 & \\ \hline & 1 & 38 & 25 & \\ & & 1 & 1 & \\ \hline & 1 & 39 & 26 & \\ & & 1 & 1 & \\ \hline & 1 & 40 & 27 & \\ & & 1 & 1 & \\ \hline & 1 & 41 & 28 & \\ & & 1 & 1 & \\ \hline & 1 & 42 & 29 & \\ & & 1 & 1 & \\ \hline & 1 & 43 & 30 & \\ & & 1 & 1 & \\ \hline & 1 & 44 & 31 & \\ & & 1 & 1 & \\ \hline & 1 & 45 & 32 & \\ & & 1 & 1 & \\ \hline & 1 & 46 & 33 & \\ & & 1 & 1 & \\ \hline & 1 & 47 & 34 & \\ & & 1 & 1 & \\ \hline & 1 & 48 & 35 & \\ & & 1 & 1 & \\ \hline & 1 & 49 & 36 & \\ & & 1 & 1 & \\ \hline & 1 & 50 & 37 & \\ & & 1 & 1 & \\ \hline & 1 & 51 & 38 & \\ & & 1 & 1 & \\ \hline & 1 & 52 & 39 & \\ & & 1 & 1 & \\ \hline & 1 & 53 & 40 & \\ & & 1 & 1 & \\ \hline & 1 & 54 & 41 & \\ & & 1 & 1 & \\ \hline & 1 & 55 & 42 & \\ & & 1 & 1 & \\ \hline & 1 & 56 & 43 & \\ & & 1 & 1 & \\ \hline & 1 & 57 & 44 & \\ & & 1 & 1 & \\ \hline & 1 & 58 & 45 & \\ & & 1 & 1 & \\ \hline & 1 & 59 & 46 & \\ & & 1 & 1 & \\ \hline & 1 & 60 & 47 & \\ & & 1 & 1 & \\ \hline & 1 & 61 & 48 & \\ & & 1 & 1 & \\ \hline & 1 & 62 & 49 & \\ & & 1 & 1 & \\ \hline & 1 & 63 & 50 & \\ & & 1 & 1 & \\ \hline & 1 & 64 & 51 & \\ & & 1 & 1 & \\ \hline & 1 & 65 & 52 & \\ & & 1 & 1 & \\ \hline & 1 & 66 & 53 & \\ & & 1 & 1 & \\ \hline & 1 & 67 & 54 & \\ & & 1 & 1 & \\ \hline & 1 & 68 & 55 & \\ & & 1 & 1 & \\ \hline & 1 & 69 & 56 & \\ & & 1 & 1 & \\ \hline & 1 & 70 & 57 & \\ & & 1 & 1 & \\ \hline & 1 & 71 & 58 & \\ & & 1 & 1 & \\ \hline & 1 & 72 & 59 & \\ & & 1 & 1 & \\ \hline & 1 & 73 & 60 & \\ & & 1 & 1 & \\ \hline & 1 & 74 & 61 & \\ & & 1 & 1 & \\ \hline & 1 & 75 & 62 & \\ & & 1 & 1 & \\ \hline & 1 & 76 & 63 & \\ & & 1 & 1 & \\ \hline & 1 & 77 & 64 & \\ & & 1 & 1 & \\ \hline & 1 & 78 & 65 & \\ & & 1 & 1 & \\ \hline & 1 & 79 & 66 & \\ & & 1 & 1 & \\ \hline & 1 & 80 & 67 & \\ & & 1 & 1 & \\ \hline & 1 & 81 & 68 & \\ & & 1 & 1 & \\ \hline & 1 & 82 & 69 & \\ & & 1 & 1 & \\ \hline & 1 & 83 & 70 & \\ & & 1 & 1 & \\ \hline & 1 & 84 & 71 & \\ & & 1 & 1 & \\ \hline & 1 & 85 & 72 & \\ & & 1 & 1 & \\ \hline & 1 & 86 & 73 & \\ & & 1 & 1 & \\ \hline & 1 & 87 & 74 & \\ & & 1 & 1 & \\ \hline & 1 & 88 & 75 & \\ & & 1 & 1 & \\ \hline & 1 & 89 & 76 & \\ & & 1 & 1 & \\ \hline & 1 & 90 & 77 & \\ & & 1 & 1 & \\ \hline & 1 & 91 & 78 & \\ & & 1 & 1 & \\ \hline & 1 & 92 & 79 & \\ & & 1 & 1 & \\ \hline & 1 & 93 & 80 & \\ & & 1 & 1 & \\ \hline & 1 & 94 & 81 & \\ & & 1 & 1 & \\ \hline & 1 & 95 & 82 & \\ & & 1 & 1 & \\ \hline & 1 & 96 & 83 & \\ & & 1 & 1 & \\ \hline & 1 & 97 & 84 & \\ & & 1 & 1 & \\ \hline & 1 & 98 & 85 & \\ & & 1 & 1 & \\ \hline & 1 & 99 & 86 & \\ & & 1 & 1 & \\ \hline & 1 & 100 & 87 & \\ & & 1 & 1 & \end{array}$

ID: PF.4.39

12. Solve the equation using the square root property.

$$(6x - 7)^2 = 36$$

$$\rightarrow \sqrt{(6x - 7)^2} = \pm \sqrt{36}$$

The solution set is .

(Simplify your answer. Type an exact answer, using radicals as needed. Type an integer or a fraction. Express complex numbers in terms of i . Use a comma to separate answers as needed.)

Answer: $\frac{13}{6}, \frac{1}{6}$

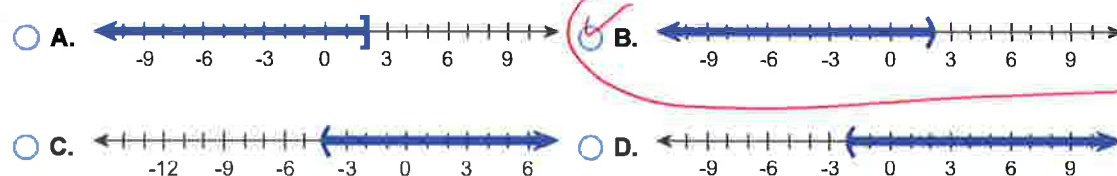
$6x - 7 = -6$ OR $6x - 7 = 6$
 $6x - 7 + 7 = -6 + 7$ OR $6x - 7 + 7 = 6 + 7$
 $6x = 1$ OR $6x = 13$
 $\frac{6x}{6} = \frac{1}{6}$ OR $\frac{6x}{6} = \frac{13}{6}$
 $x = \frac{1}{6}$ OR $x = \frac{13}{6}$

ID: PF.4.55

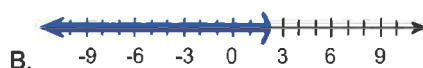
13. Solve the inequality $20 - 2x > 16$. Graph the solution set.

In set notation, the solution is $\{x | \text{[]}\}$. (Type an inequality.)

Graph the solution set. Choose the correct graph below.



Answers $x < 2$



ID: 1.1.4

$$20 - 2x > 16$$

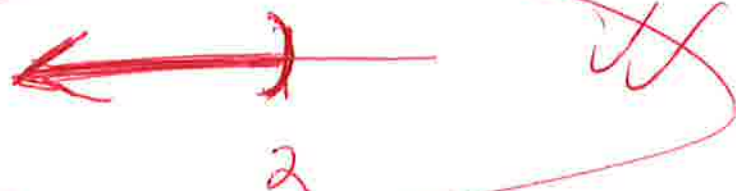
$$20 - 2x - 20 > 16 - 20$$

$$-2x > -4$$

$$\frac{-2x}{-2} < \frac{-4}{-2}$$

$$x < 2$$

divide by a negative
and turn the
alligator around



$$(-\infty, 2)$$

14. Find the following for the function $f(x) = 3x^2 + 3x - 2$.

(a) $f(0)$

(b) $f(3)$

(c) $f(-3)$

(d) $f(-x)$

(e) $-f(x)$

(f) $f(x+1)$

(g) $f(3x)$

(h) $f(x+h)$

(a) $f(0) =$ (Simplify your answer.)

(b) $f(3) =$ (Simplify your answer.)

(c) $f(-3) =$ (Simplify your answer.)

(d) $f(-x) =$ (Simplify your answer.)

(e) $-f(x) =$ (Simplify your answer.)

(f) $f(x+1) =$ (Simplify your answer.)

(g) $f(3x) =$ (Simplify your answer.)

(h) $f(x+h) =$ (Simplify your answer.)

Answers - 2

34

16

$3x^2 - 3x - 2$

$-3x^2 - 3x + 2$

$3x^2 + 9x + 4$

$27x^2 + 9x - 2$

$3x^2 + 6hx + 3h^2 + 3x + 3h - 2$

ID: 1.1.43

$$(14) a \quad f(x) = 3x^2 + 3x - 2$$

$$f(0) = 3(0)^2 + 3(0) - 2$$

$$f(0) = 3(0)(0) + 3(0) - 2$$

$$f(0) = 3(0) + 3(0) - 2$$

$$f(0) = 0 + 0 - 2$$

$$f(0) = 0 - 2$$

$$f(0) = -2 \quad \checkmark$$

(14) b

$$f(x) = 3x^2 + 3x - 2$$

$$f(3) = 3(3)^2 + 3(3) - 2$$

$$f(3) = 3(3)(3) + 3(3) - 2$$

$$f(3) = 3(9) + 3(3) - 2$$

$$f(3) = 27 + 9 - 2$$

$$f(3) = 36 - 2$$

$$f(3) = 34 \quad \checkmark$$

(14) c

$$f(x) = 3x^2 + 3x - 2$$

$$f(-3) = 3(-3)^2 + 3(-3) - 2$$

$$f(-3) = 3(-3)(-3) + 3(-3) - 2$$

$$f(-3) = 3(9) + 3(-3) - 2$$

$$f(-3) = 27 - 9 - 2$$

$$f(-3) = 18 - 2$$

$$f(-3) = 16 \quad \checkmark \checkmark$$

(14) d

$$f(x) = 3x^2 + 3x - 2$$

$$f(-x) = 3(-x)^2 + 3(-x) - 2$$

$$f(-x) = 3(-x)(-x) + 3(-x) - 2$$

$$f(-x) = 3(x^2) + 3(-x) - 2$$

$$f(-x) = 3x^2 - 3x - 2 \quad \checkmark \checkmark$$

(14) e

$$f(x) = 3x^2 + 3x - 2$$

$$-f(x) = -(3x^2 + 3x - 2)$$

$$-f(x) = -3x^2 - 3x + 2$$

(14) f

$$f(x) = 3x^2 + 3x - 2$$

$$f(x+1) = 3(x+1)^2 + 3(x+1) - 2$$

$$f(x+1) = 3(x+1)(x+1) + 3(x+1) - 2$$

$$f(x+1) = 3(x^2 + 1x + 1x + 1) + 3(x+1) - 2$$

$$f(x+1) = 3(x^2 + 2x + 1) + 3(x+1) - 2$$

$$f(x+1) = 3x^2 + 6x + 3 + 3x + 3 - 2$$

$$f(x+1) = 3x^2 + 9x + 4$$

14 g

$$f(x) = 3x^2 + 3x - 2$$

$$f(3x) = 3(3x)^2 + 3(3x) - 2$$

$$f(3x) = 3(3x)(3x) + 3(3x) - 2$$

$$f(3x) = 3(9x^2) + 3(3x) - 2$$

$$f(3x) = 27x^2 + 9x - 2$$

14 h

$$f(x) = 3x^2 + 3x - 2$$

$$f(x+h) = 3(x+h)^2 + 3(x+h) - 2$$

$$f(x+h) = 3(x+h)(x+h) + 3(x+h) - 2$$

$$f(x+h) = 3(x^2 + (xh + 1xh + h^2)) + 3(x+h) - 2$$

$$f(x+h) = 3(x^2 + 2xh + h^2) + 3(x+h) - 2$$

$$f(x+h) = 3x^2 + 6xh + 3h^2 + 3x + 3h - 2$$

15. Find the domain of the function.

$$f(x) = \sqrt{6x - 36}$$

The domain is . (Type your answer in interval notation.)

Answer: $[6, \infty)$

ID: 1.1.59

formula
domain
 $f(x) = \sqrt{Ax+B}$
set $Ax+B \geq 0$

$$f(x) = \sqrt{6x - 36}$$

$$\text{set } 6x - 36 \geq 0$$

$$6x - 36 + 36 \geq 0 + 36$$

$$6x \geq 36$$

$$\frac{6x}{6} \geq \frac{36}{6}$$

$$x \geq 6$$



$$[6, \infty)$$

5 of 25

12/12/2019, 8:39 AM

16. For the given functions f and g , complete parts (a)-(h). For parts (a)-(d), also find the domain.

$f(x) = 5x + 6$; $g(x) = 8x - 7$

(a) Find $(f + g)(x)$.

$(f + g)(x) = \boxed{}$ (Simplify your answer.)

$(f+g)(x) =$
 $f(x) + g(x) =$
 $(5x+6) + (8x-7) =$
 $5x+6+8x-7 =$

domain
 $(-\infty, \infty)$

What is the domain of $f + g$? Select the correct choice below and, if necessary, fill in the answer box to complete your choice.

$13x - 1 =$

A. The domain is $\{x \mid \}$. (Use integers or fractions for any numbers in the expression. Use a comma to separate answers as needed.)

B. The domain is $\{x \mid x \text{ is any real number}\}$.

(b) Find $(f - g)(x)$.

$(f - g)(x) = \boxed{}$ (Simplify your answer.)

$(f-g)(x) =$
 $f(x) - g(x) =$
 $(5x+6) - (8x-7) =$
 $5x+6-8x+7 =$

domain
 $(-\infty, \infty)$

What is the domain of $f - g$? Select the correct choice below and, if necessary, fill in the answer box to complete your choice.

A. The domain is $\{x \mid \}$. (Use integers or fractions for any numbers in the expression. Use a comma to separate answers as needed.)

B. The domain is $\{x \mid x \text{ is any real number}\}$.

(c) Find $(f \cdot g)(x)$.

$(f \cdot g)(x) = \boxed{}$ (Simplify your answer.)

$(f \cdot g)(x) =$
 $f(x) \cdot g(x) =$
 $(5x+6)(8x-7) =$
 $40x^2 - 35x + 48x - 42 =$

domain
 $(-\infty, \infty)$

What is the domain of $f \cdot g$? Select the correct choice below and, if necessary, fill in the answer box to complete your choice.

A. The domain is $\{x \mid \}$. (Use integers or fractions for any numbers in the expression. Use a comma to separate answers as needed.)

B. The domain is $\{x \mid x \text{ is any real number}\}$.

(d) Find $\left(\frac{f}{g}\right)(x)$.

$\left(\frac{f}{g}\right)(x) = \boxed{}$ (Simplify your answer.)

$\left(\frac{f}{g}\right)(x) =$

$\frac{f(x)}{g(x)} =$
 $\frac{5x+6}{8x-7} =$

set $8x-7=0$
 $8x-7+7=0+7$
 $8x=7$
 $\frac{8x}{8} = \frac{7}{8}$
 $x = \frac{7}{8}$

What is the domain of $\frac{f}{g}$? Select the correct choice below and, if necessary, fill in the answer box to complete your choice.

A. The domain is $\{x \mid \}$. (Use integers or fractions for any numbers in the expression. Use a comma to separate answers as needed.)

B. The domain is $\{x \mid x \text{ is any real number}\}$.

(e) Find $(f + g)(2)$.

$(f+g)(x) = 13x - 1$
 $(f+g)(2) = 13(2) - 1$
 $(f+g)(2) = 26 - 1$
 $(f+g)(2) = 25$

domain
 $x \neq \frac{7}{8}$

$(f + g)(2) = \text{[]}$ (Type an integer or a simplified fraction.)

$(f - g)(x) = -3x + 13$

(f) Find $(f - g)(3)$.

$(f - g)(3) = -3(3) + 13$

$(f - g)(3) = \text{[]}$ (Type an integer or a simplified fraction.)

$(f - g)(3) = -9 + 13$

(g) Find $(f \cdot g)(4)$.

$(f - g)(3) = 4$ ✓

$(f \cdot g)(4) = \text{[]}$ (Type an integer or a simplified fraction.)

$(f \cdot g)(x) = 40x^2 + 13x - 42$

(h) Find $\left(\frac{f}{g}\right)(1)$.

$(f \cdot g)(4) = 40(4)^2 + 13(4) - 42$

$\left(\frac{f}{g}\right)(1) = \text{[]}$ (Type an integer or a simplified fraction.)

$(f \cdot g)(4) = 40(4)(4) + 13(4) - 42$

$(f \cdot g)(4) = 40(16) + 13(4) - 42$

$(f \cdot g)(4) = 640 + 52 - 42$

$(f \cdot g)(4) = 650$ ✓

Answers $13x - 1$

B. The domain is $\{x \mid x \text{ is any real number}\}$.

$-3x + 13$

B. The domain is $\{x \mid x \text{ is any real number}\}$.

$40x^2 + 13x - 42$

B. The domain is $\{x \mid x \text{ is any real number}\}$.

$\frac{5x + 6}{8x - 7}$

$\left(\frac{f}{g}\right)(x) = \frac{5x + 6}{8x - 7}$

A. The domain is $\left\{x \mid \text{[] } x \neq \frac{7}{8}\right\}$.

$\left(\frac{f}{g}\right)(1) = \frac{5(1) + 6}{8(1) - 7}$

(Use integers or fractions for any numbers in the expression. Use a comma to separate answers as needed.)

25

$\left(\frac{f}{g}\right)(1) = \frac{5 + 6}{8 - 7}$

4

650

$\left(\frac{f}{g}\right)(1) = \frac{11}{1}$

11

$\left(\frac{f}{g}\right)(1) = 11$ ✓

ID: 1.1.67

17. For the given functions f and g , complete parts (a)-(h). For parts (a)-(d), also find the domain.

$f(x) = x - 5; g(x) = 5x^2$

(a) Find $(f + g)(x)$.

$(f + g)(x) = \text{[]}$ (Simplify your answer.)

Handwritten work for (a):
 $(f + g)(x) =$
 $f(x) + g(x) =$
 $(x - 5) + (5x^2) =$
 $x - 5 + 5x^2 =$
 $5x^2 + x - 5 =$ (circled)
 Domain: $(-\infty, \infty)$ (circled)

What is the domain of $f + g$? Select the correct choice below and, if necessary, fill in the answer box to complete your choice.

A. The domain is $\{x \mid \text{[]}\}$.
 (Use integers or fractions for any numbers in the expression. Use a comma to separate answers as needed.)

B. The domain is $\{x \mid x \text{ is any real number}\}$.

(b) Find $(f - g)(x)$.

$(f - g)(x) = \text{[]}$ (Simplify your answer.)

Handwritten work for (b):
 $(f - g)(x) =$
 $f(x) - g(x) =$
 $(x - 5) - (5x^2) =$
 $x - 5 - 5x^2 =$
 $-5x^2 + x - 5 =$ (circled)
 Domain: $(-\infty, \infty)$ (circled)

What is the domain of $f - g$? Select the correct choice below and, if necessary, fill in the answer box to complete your choice.

A. The domain is $\{x \mid \text{[]}\}$.
 (Use integers or fractions for any numbers in the expression. Use a comma to separate answers as needed.)

B. The domain is $\{x \mid x \text{ is any real number}\}$.

(c) Find $(f \cdot g)(x)$.

$(f \cdot g)(x) = \text{[]}$ (Simplify your answer.)

Handwritten work for (c):
 $(f \cdot g)(x) =$
 $f(x) \cdot g(x) =$
 $(x - 5)(5x^2) =$
 $5x^3 - 25x^2 =$ (circled)
 Domain: $(-\infty, \infty)$ (circled)

What is the domain of $f \cdot g$? Select the correct choice below and, if necessary, fill in the answer box to complete your choice.

A. The domain is $\{x \mid \text{[]}\}$.
 (Use integers or fractions for any numbers in the expression. Use a comma to separate answers as needed.)

B. The domain is $\{x \mid x \text{ is any real number}\}$.

(d) Find $\left(\frac{f}{g}\right)(x)$.

$\left(\frac{f}{g}\right)(x) = \text{[]}$ (Simplify your answer.)

Handwritten work for (d):
 $\left(\frac{f}{g}\right)(x) =$
 $\frac{f(x)}{g(x)} =$
 $\frac{x - 5}{5x^2} =$ (circled)
 Domain: $x \neq 0$ (circled)
 Additional work:
 $5x^2 = 0$
 $5x^2 = \frac{0}{5}$
 $x^2 = 0$
 $\sqrt{x^2} = \sqrt{0}$
 $x = 0$

What is the domain of $\frac{f}{g}$? Select the correct choice below and, if necessary, fill in the answer box to complete your choice.

A. The domain is $\{x \mid \text{[]}\}$.
 (Use integers or fractions for any numbers in the expression. Use a comma to separate answers as needed.)

B. The domain is $\{x \mid x \text{ is any real number}\}$.

(e) Find $(f + g)(2)$.

Handwritten work for (e):
 $(f + g)(x) = 5x^2 + x - 5$
 $(f + g)(2) = 5(2)^2 + (2) - 5$
 $(f + g)(2) = 5(2)(2) + (2) - 5$
 $(f + g)(2) = 20 + 2 - 5$
 $(f + g)(2) = 17$ (circled)

$(f + g)(2) = \boxed{}$ (Type an integer or a simplified fraction.)

(f) Find $(f - g)(4)$.

$(f - g)(4) = \boxed{}$ (Type an integer or a simplified fraction.)

(g) Find $(f \cdot g)(3)$.

$(f \cdot g)(3) = \boxed{}$ (Type an integer or a simplified fraction.)

(h) Find $\left(\frac{f}{g}\right)(2)$.

$\left(\frac{f}{g}\right)(2) = \boxed{}$ (Type an integer or a simplified fraction.)

$$(f - g)(x) = -5x^2 + x - 5$$

$$(f - g)(4) = -5(4)^2 + (4) - 5$$

$$(f - g)(4) = -5(4)(4) + (4) - 5$$

$$(f - g)(4) = -5(16) + (4) - 5$$

$$(f - g)(4) = -80 + 4 - 5$$

$$(f - g)(4) = -81$$

$$(f \cdot g)(x) = 5x^3 - 25x^2$$

$$(f \cdot g)(3) = 5(3)^3 - 25(3)^2$$

$$(f \cdot g)(3) = 5(3)(3)(3) - 25(3)(3)$$

$$(f \cdot g)(3) = 5(27) - 25(9)$$

$$(f \cdot g)(3) = 135 - 225$$

$$(f \cdot g)(3) = -90$$

Answers $5x^2 + x - 5$

B. The domain is $\{x \mid x \text{ is any real number}\}$.

$$-5x^2 + x - 5$$

B. The domain is $\{x \mid x \text{ is any real number}\}$.

$$5x^3 - 25x^2$$

B. The domain is $\{x \mid x \text{ is any real number}\}$.

$$\frac{x - 5}{5x^2}$$

A. The domain is $\{x \mid \boxed{x \neq 0}\}$.

(Use integers or fractions for any numbers in the expression. Use a comma to separate answers as needed.)

17

-81

-90

$-\frac{3}{20}$

$$\left(\frac{f}{g}\right)(x) = \frac{x - 5}{5x^2}$$

$$\left(\frac{f}{g}\right)(2) = \frac{(2) - 5}{5(2)^2}$$

$$\left(\frac{f}{g}\right)(2) = \frac{2 - 5}{5(2)(2)}$$

$$\left(\frac{f}{g}\right)(2) = \frac{-3}{20}$$

18. Find the difference quotient of f ; that is, find $\frac{f(x+h) - f(x)}{h}$, $h \neq 0$, for the following function. Be sure to simplify.

$$f(x) = x^2 - 3x + 6$$

$$\frac{f(x+h) - f(x)}{h} = \boxed{}$$

Answer: $2x + h - 3$

ID: 1.1.83

$$f(x) = x^2 - 3x + 6$$

9 of 25

12/12/2019, 8:39 AM

$$\frac{f(x+h) - f(x)}{h} =$$

$$\frac{(x+h)^2 - 3(x+h) + 6 - (x^2 - 3x + 6)}{h} =$$

$$\frac{(x+h)(x+h) - 3x - 3h + 6 - x^2 + 3x - 6}{h} =$$

$$\frac{x^2 + 1xh + 1xh + h^2 - 3x - 3h + 6 - x^2 + 3x - 6}{h} =$$

$$\frac{x^2 + 2xh + h^2 - 3x - 3h + 6 - x^2 + 3x - 6}{h} =$$

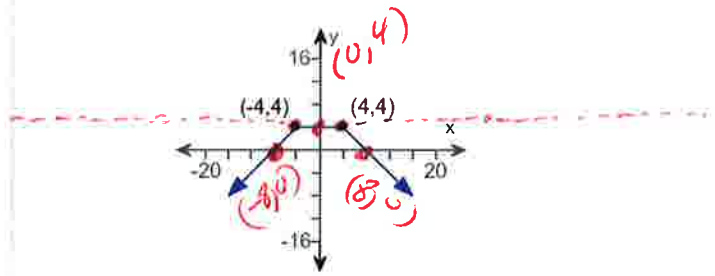
$$\frac{\cancel{x^2} + 2xh + h^2 - \cancel{3x} - 3h + \cancel{6} - \cancel{x^2} + \cancel{3x} - \cancel{6}}{h} =$$

$$\frac{2xh + h^2 - 3h}{h} =$$

$$\frac{2xh}{h} + \frac{h^2}{h} - \frac{3h}{h} =$$

$$2x + h - 3 =$$

19. Determine whether the graph is that of a function by using the vertical-line test. If it is, use the graph to find
- (a) its domain and range.
 - (b) the intercepts, if any.
 - (c) any symmetry with respect to the x-axis, y-axis, or the origin.



Is the graph that of a function?

- Yes
- No

If the graph is that of a function, what are the domain and range of the function? Select the correct choice below and fill in any answer boxes within your choice.

- A. The domain is $(-\infty, \infty)$. The range is $(-\infty, 4]$. (Type your answers in interval notation.)
- B. The graph is not a function.

What are the intercepts? Select the correct choice below and fill in any answer boxes within your choice.

- A. $(-8, 0), (8, 0), (0, 4)$. (Type an ordered pair. Use a comma to separate answers as needed.)
- B. There are no intercepts.
- C. The graph is not a function.

Determine if the graph is symmetrical.

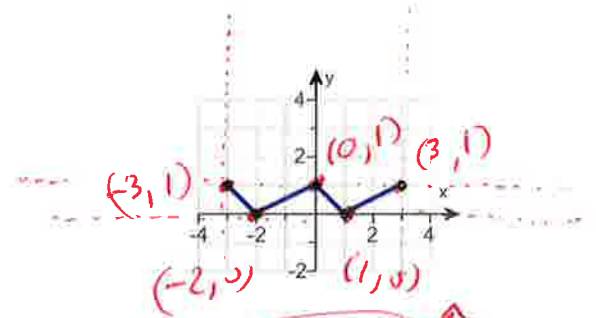
- A. It is symmetrical with respect to the y-axis.
- B. It is symmetrical with respect to the x-axis.
- C. It is symmetrical with respect to the origin.
- D. The graph is not symmetrical.
- E. The graph is not a function.

Answers Yes

- A. The domain is $(-\infty, \infty)$. The range is $(-\infty, 4]$. (Type your answers in interval notation.)
- A. $(8, 0), (-8, 0), (0, 4)$ (Type an ordered pair. Use a comma to separate answers as needed.)
- A. It is symmetrical with respect to the y-axis.

ID: 1.2.21

20. Using the given graph of the function f , find the following.



- (a) the intercepts, if any
- (b) its domain and range
- (c) the intervals on which it is increasing, decreasing, or constant
- (d) whether it is even, odd, or neither

(a) What are the intercepts?

, ,
 (Simplify your answer. Type an ordered pair. Use a comma to separate answers as needed.)

(b) The domain is
 (Type your answer in interval notation.)

The range is
 (Type your answer in interval notation.)

(c) On which interval(s) is the graph increasing? Select the correct choice below and fill in any answer boxes within your choice.

- A. The graph is increasing on ,
 (Type your answer in interval notation. Use a comma to separate answers as needed.)
- B. The graph is not increasing on any interval.

On which interval(s) is the graph decreasing? Select the correct choice below and fill in any answer boxes within your choice.

- A. The graph is decreasing on ,
 (Type your answer in interval notation. Use a comma to separate answers as needed.)
- B. The graph is not decreasing on any interval.

On which interval(s) is the graph constant? Select the correct choice below and fill in any answer boxes within your choice.

- A. The graph is constant on _____
 (Type your answer in interval notation. Use a comma to separate answers as needed.)
- B. The graph is not constant on any interval.

(d) The function is (1)

- (1) odd.
- neither odd nor even.
- even.

Example ↑
 Favorite place
 for a double
 meat, double cheese,
 double bacon
 hamburger with
 Diet Tea.

Food taste
 better at 3:30
 am when she
 good cooks
 work.

you can
 work out after
 you eat.

Answers $(-2,0),(1,0),(0,1)$

$[-3,3]$

$[0,1]$

A. The graph is increasing on $[-2,0],[1,3]$.

(Type your answer in interval notation. Use a comma to separate answers as needed.)

A. The graph is decreasing on $[-3,-2],[0,1]$.

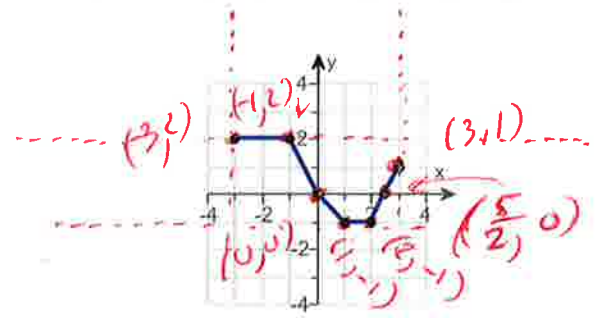
(Type your answer in interval notation. Use a comma to separate answers as needed.)

B. The graph is not constant on any interval.

(1) neither odd nor even.

ID: 1.3.25

21. Using the given graph of the function f , find the following.



- (a) the intercepts, if any
- (b) its domain and range
- (c) the intervals on which it is increasing, decreasing, or constant
- (d) whether it is even, odd, or neither

(a) What are the intercepts?

,
 (Simplify your answer. Type an ordered pair. Use a comma to separate answers as needed.)

(b) The domain is
 (Type your answer in interval notation.)

The range is
 (Type your answer in interval notation.)

(c) On which interval(s) is the graph increasing? Select the correct choice below and fill in any answer boxes within your choice.

- A. The graph is increasing on
 (Type your answer in interval notation. Use a comma to separate answers as needed.)
- B. The graph is not increasing on any interval.

On which interval(s) is the graph decreasing? Select the correct choice below and fill in any answer boxes within your choice.

- A. The graph is decreasing on
 (Type your answer in interval notation. Use a comma to separate answers as needed.)
- B. The graph is not decreasing on any interval.

On which interval(s) is the graph constant? Select the correct choice below and fill in any answer boxes within your choice.

- A. The graph is constant on
 (Type your answer in interval notation. Use a comma to separate answers as needed.)
- B. The graph is not constant on any interval.

(d) The function is (1)

- (1) neither odd nor even.
- even.
- odd.

Answers $(0,0), \left(\frac{5}{2},0\right)$

$[-3,3]$

$[-1,2]$

A. The graph is increasing on .

(Type your answer in interval notation. Use a comma to separate answers as needed.)

A. The graph is decreasing on .

(Type your answer in interval notation. Use a comma to separate answers as needed.)

A. The graph is constant on .

(Type your answer in interval notation. Use a comma to separate answers as needed.)

(1) neither odd nor even.

ID: 1.3.31

22. The function f is defined as follows.

$$f(x) = \begin{cases} 3 + x & \text{if } x < 0 \\ x^2 & \text{if } x \geq 0 \end{cases}$$

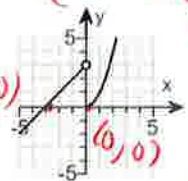
- (a) Find the domain of the function.
- (b) Locate any intercepts.
- (c) Graph the function.
- (d) Based on the graph, find the range.

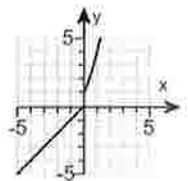
(a) The domain of the function f is $(-\infty, \infty)$ ← (left, right)
 (Type your answer in interval notation.)

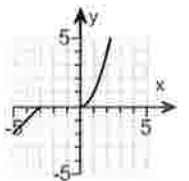
(b) Locate any intercepts. Select the correct choice below and, if necessary, fill in the answer box to complete your choice.

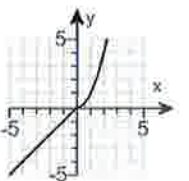
- A. The intercept(s) is/are $(-3, 0), (0, 0)$
 (Type an ordered pair. Use a comma to separate answers as needed.)
- B. There are no intercepts.

(c) Choose the correct graph of $f(x)$ below.

A. $(0, 3)$ OPEN circle
 $(-3, 0)$


B. 

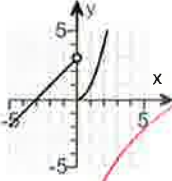
C. 

D. 

(d) The range of the function f is $(-\infty, \infty)$ ← (bottom, top)
 (Type your answer in interval notation.)

Answers $(-\infty, \infty)$

A. The intercept(s) is/are $(-3, 0), (0, 0)$.
 (Type an ordered pair. Use a comma to separate answers as needed.)

A. 
 $(-\infty, \infty)$

Window
 $x - \min = -12$
 $x - \max = 12$
 $y - \min = -10$
 $y - \max = 10$

USE graphing calculator

2ND meth

ID: 1.4.37

$y_1 = 3 + x$ ○ (x < 0) OPEN circle
 2ND meth
 $y_2 = x^2$ ● (x ≥ 0) CLOSE circle

23.

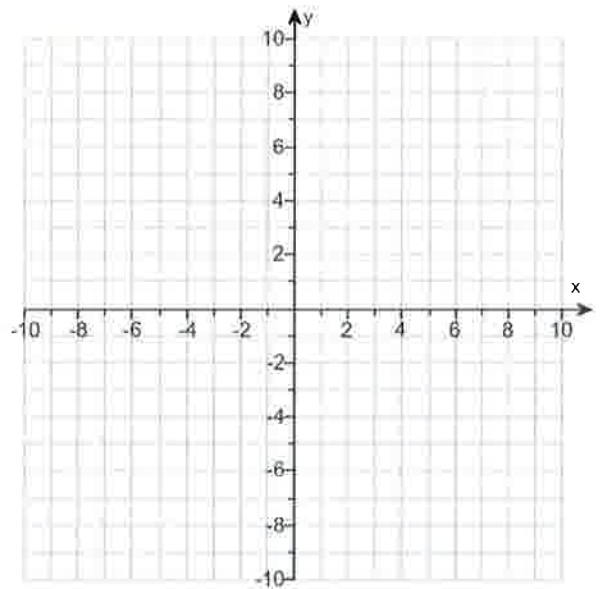
- (a) Graph $f(x) = |x + 2| - 4$ using transformations.
- (b) Find the area of the region bounded by f and the x -axis that lies below the x -axis.

(a) Graph $f(x)$.

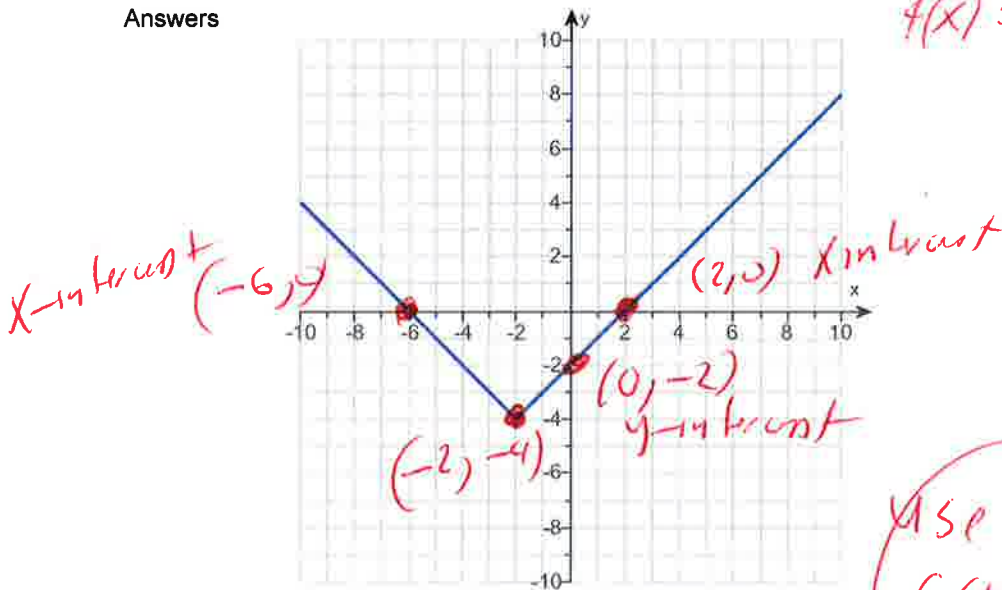
(Use the graphing tool provided to graph the function.)

(b) The area of the region bounded by f and the x -axis that lies below the x -axis is square units.

(Simplify your answer.)



Answers



$$f(x) = |x + 2| - 4$$

x	$f(x)$
-6	0
-2	-4
0	-2
2	0

Use Graphing Calculator

16

ID: 1.5.81

Window
 $x - \min = -12$
 $x - \max = 12$
 $y - \min = -10$
 $y - \max = 10$

$y_1 = \text{Math}; \text{Num}; \text{abs}$

$y_1 = \text{abs}(x + 2) - 4$
 Shift left -2
 Shift down -4

24. Factor the polynomial completely. If the polynomial cannot be factored, say it is prime. Be sure to look for a greatest common factor.

$$-20m^2 - 18m + 18$$

$$\begin{aligned} -20m^2 - 18m + 18 &= \\ -2(10m^2 + 9m - 9) &= \end{aligned}$$

Select the correct choice below and, if necessary, fill in the answer box to complete your choice.

- A. $-20m^2 - 18m + 18 =$ _____
- B. The polynomial is prime.

$$-2(5m - 3)(2m + 3) =$$

Possibly

10 · 1	9 · 1
2 · 5	3 · 3

Answer: A. $-20m^2 - 18m + 18 =$ $-2(5m - 3)(2m + 3)$

ID: P2.1.21

25. Factor the polynomial completely. If the polynomial cannot be factored, say it is prime. Be sure to look for a greatest common factor.

$$36p^2 + 21p + 3$$

$$36p^2 + 21p + 3 =$$

Select the correct choice below and, if necessary, fill in the answer box to complete your choice.

- A. $36p^2 + 21p + 3 =$ _____
- B. The polynomial is prime.

$$\begin{aligned} 3(12p^2 + 7p + 1) &= \\ 3(3p + 1)(4p + 1) &= \end{aligned}$$

Possibly

12 · 1	1 · 1
6 · 2	
3 · 4	

Answer: A. $36p^2 + 21p + 3 =$ $3(3p + 1)(4p + 1)$

ID: P2.1.23

26. Factor the polynomial completely. If the polynomial cannot be factored, say it is prime. Be sure to look for a greatest common factor.

$$3x^3 - 30x^2 + 72x$$

$$3x^3 - 30x^2 + 72x =$$

Select the correct choice below and, if necessary, fill in the answer box to complete your choice.

- A. $3x^3 - 30x^2 + 72x =$ _____
- B. The polynomial is prime.

$$\begin{aligned} 3x(x^2 - 10x + 24) &= \\ 3x(x - 4)(x - 6) &= \end{aligned}$$

Possibly

1 · 1	24 · 1
	12 · 2
	6 · 4
	3 · 8

Answer: A. $3x^3 - 30x^2 + 72x =$ $3x(x - 4)(x - 6)$

ID: P2.1.25

27. Solve the following equation using the quadratic formula.

$$3x^2 - 2x - 1 = 0$$

$$a=3, b=-2, c=-1$$

The solution set is

(Type an exact answer, using radicals and i as needed. Use integers or fractions for any numbers in the expression. Use a comma to separate answers as needed.)

Answer: $1, -\frac{1}{3}$

ID: Quick Check P2.2.2

Handwritten work for problem 27:

$$x = \frac{-b \pm \sqrt{b^2 - 4ac}}{2a} = \frac{-(-2) \pm \sqrt{(-2)^2 - 4(3)(-1)}}{2(3)} = \frac{2 \pm \sqrt{4+12}}{6}$$

$$= \frac{2 \pm \sqrt{16}}{6}$$

$$= \frac{2 \pm 4}{6}$$

$x = \frac{2+4}{6}$ OR $x = \frac{2-4}{6}$
 $x = \frac{6}{6}$ OR $x = -\frac{2}{6}$
 $x = 1$ OR $x = -\frac{1}{3}$

28. Solve the equation using the quadratic formula.

$$x^2 - 9x - 36 = 0$$

$$a=1, b=-9, c=-36$$

The solution set is

(Simplify your answer. Type an exact answer, using radicals and i as needed. Use integers or fractions for any numbers in the expression. Use a comma to separate answers as needed.)

Answer: $-3, 12$

ID: P2.2.11

Handwritten work for problem 28:

$$x = \frac{-b \pm \sqrt{b^2 - 4ac}}{2a} = \frac{-(-9) \pm \sqrt{(-9)^2 - 4(1)(-36)}}{2(1)} = \frac{9 \pm \sqrt{81+144}}{2}$$

$$= \frac{9 \pm \sqrt{225}}{2}$$

$$= \frac{9 \pm 15}{2}$$

$x = \frac{9+15}{2}$ OR $x = \frac{9-15}{2}$
 $x = \frac{24}{2}$ OR $x = -\frac{6}{2}$
 $x = 12$ OR $x = -3$

29. Solve the equation using the quadratic formula.

$$3x^2 - x - 10 = 0$$

$$3x^2 - x - 10 = 0$$

$$a=3, b=-1, c=-10$$

The solution set is

(Simplify your answer. Type an exact answer, using radicals and i as needed. Use integers or fractions for any numbers in the expression. Use a comma to separate answers as needed.)

Answer: $-\frac{5}{3}, 2$

ID: P2.2.13

Handwritten work for problem 29:

$$x = \frac{-b \pm \sqrt{b^2 - 4ac}}{2a} = \frac{-(-1) \pm \sqrt{(-1)^2 - 4(3)(-10)}}{2(3)}$$

$$= \frac{1 \pm \sqrt{1+120}}{6}$$

$$x = \frac{1 \pm \sqrt{121}}{6}$$

$$x = \frac{1 \pm 11}{6}$$

$x = \frac{1+11}{6}$ OR $x = \frac{1-11}{6}$
 $x = \frac{12}{6}$ OR $x = -\frac{10}{6}$
 $x = 2$ OR $x = -\frac{5}{3}$

30. Find the zeros, if any, of the quadratic function using the quadratic formula. What are the x-intercepts, if any, of the graph of the function?

$$f(x) = 2x^2 + 1 + 6x$$

Select the correct choice below and, if necessary, fill in the answer box to complete your choice. (Simplify your answer, including any radicals. Use integers or fractions for any numbers in the expression. Use a comma to separate answers as needed.)

- A. The zeros and the x-intercepts are different. The zeros are _____, the x-intercepts are _____.
- B. The zeros and the x-intercepts are the same. They are _____.
- C. There is no real zero solution and no x-intercept.

Answer: B. The zeros and the x-intercepts are the same. They are

$\frac{-3 + \sqrt{7}}{2}$	$\frac{-3 - \sqrt{7}}{2}$
---------------------------	---------------------------

ID: 2.3.47

$f(x) = 2x^2 + 6x + 1$ rewrite \leftarrow
 $a=2, b=6, c=1$

$x = \frac{-b \pm \sqrt{b^2 - 4ac}}{2a}$ formula

$$x = \frac{-(6) \pm \sqrt{(6)^2 - 4(2)(1)}}{2(2)}$$

$$x = \frac{-6 \pm \sqrt{36 - 8}}{4}$$

$$x = \frac{-6 \pm \sqrt{28}}{4}$$

$$x = \frac{-6 \pm \sqrt{4 \cdot 7}}{4}$$

$$x = \frac{-6 \pm \sqrt{4} \sqrt{7}}{4}$$

$$x = \frac{-6 \pm 2\sqrt{7}}{4}$$

$$x = \frac{2(-3 \pm \sqrt{7})}{2(2)}$$

Primes
 2, 3, 5, 7, 11, 13, ...
 $28 = 4 \cdot 7$

28
28
07
1

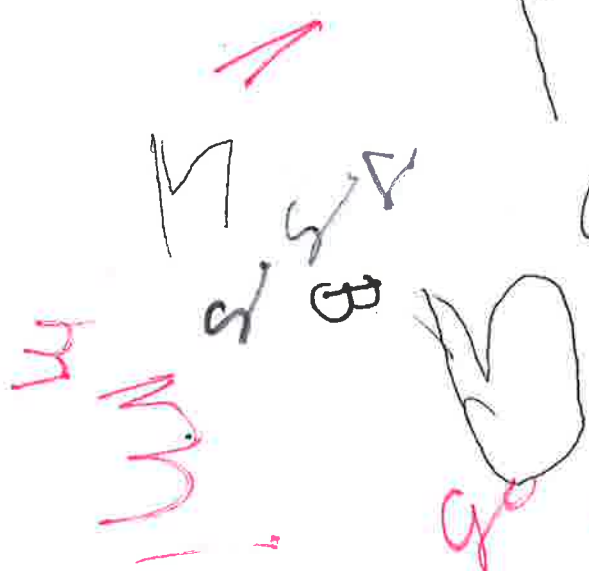
$$x = \frac{-3 \pm \sqrt{7}}{2}$$

$$x = \frac{-3 \pm \sqrt{7}}{2}$$

$x = \frac{-3 + \sqrt{7}}{2}$ OR

$x = \frac{-3 - \sqrt{7}}{2}$

THONGZ



ARIA

MATH is fun

31

For the quadratic function $f(x) = x^2 + 2x - 8$, answer parts (a) through (c).

(a) Graph the quadratic function by determining whether its graph opens up or down and by finding its vertex, axis of symmetry, y-intercept, and x-intercepts, if any.

Does the graph of f open up or down?

- up
 down

What are the coordinates of the vertex?

The vertex of the parabola is .

(Type an ordered pair. Use integers or fractions for any numbers in the expression.)

What is the equation of the axis of symmetry?

The axis of symmetry is .

(Type an equation.)

What is/are the x-intercept(s)? Select the correct choice below and, if necessary, fill in the answer box to complete your choice.

- A. The x-intercept(s) is/are

(Type an integer or a decimal. Use a comma to separate answers as needed.)

- B. There are no x-intercepts.

What is the y-intercept? Select the correct choice below and, if necessary, fill in the answer box to complete your choice.

- A. The y-intercept is
 (Type an integer or a decimal.)

- B. There is no y-intercept.

Use the graphing tool to graph the function.

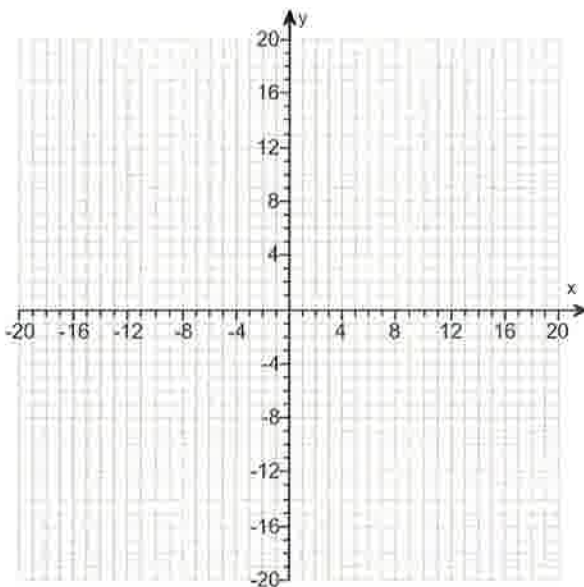
(b) Determine the domain and the range of the function.

The domain of f is
 (Type your answer in interval notation.)

The range of f is
 (Type your answer in interval notation.)

(c) Determine where the function is increasing and where it is decreasing.

The function is increasing on the interval
 (Type your answer in interval notation.)



Answers up

$(-1, -9)$

$x = -1$

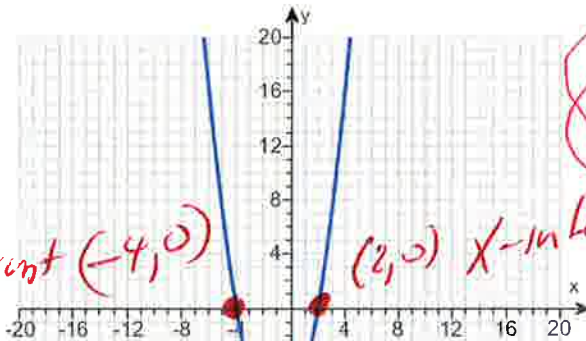
A. The x-intercept(s) is/are .

(Type an integer or a decimal. Use a comma to separate answers as needed.)

A. The y-intercept is . (Type an integer or a decimal.)

*Shark Law #1
Sharks eat only in
the day.*

$f(x) = x^2 + 2x - 8$



x-intercept (-4, 0)

(2, 0) x-intercept

*(-1, -9) vertex
(0, -8) y-intercept*

*You are
the vertex*

*Swim only for
2 hours or you
may get leg and
arm cramps*

x	f(x)
-4	0
-1	-9
0	-8
2	0

$(-\infty, \infty)$

$[-9, \infty)$

$[-1, \infty)$

$(-\infty, -1]$

*window
x-min = -12
x-max = 12
y-min = -10
y-max = 10*

*Example
Swimming in the
ocean by yourself
on Saturday night at
3:33 am after eating a
double meat, double cheese
double bacon hamburger
with a diet soda.*

ID: 2.4.37

32. Solve the equation in the complex number system

$x^2 - 12x + 40 = 0$

a=1, b=-12, c=40

The solution set is . (Use a comma to separate answers as needed.)

Answer: $6 - 2i, 6 + 2i$

$$x = \frac{-b \pm \sqrt{b^2 - 4ac}}{2a} = \frac{-(-12) \pm \sqrt{(-12)^2 - 4(1)(40)}}{2(1)}$$

$$= \frac{12 \pm \sqrt{144 - 160}}{2}$$

$$= \frac{12 \pm \sqrt{-16}}{2}$$

$$= \frac{12 \pm 4i}{2}$$

$$= \frac{12}{2} \pm \frac{4i}{2}$$

$$x = 6 \pm 2i$$

ID: 3.3.2

$x = 6 - 2i$ OR $x = 6 + 2i$

*Example
Formulas
 $\sqrt{1} = 1$
 $\sqrt{4} = 2i$
 $\sqrt{9} = 3i$
 $\sqrt{16} = 4i$*

33. For $f(x) = 9x + 8$ and $g(x) = 2x$, find the following composite functions and state the domain of each.

- (a) $f \circ g$ (b) $g \circ f$ (c) $f \circ f$ (d) $g \circ g$

(a) $(f \circ g)(x) =$ (Simplify your answer.)

Select the correct choice below and fill in any answer boxes within your choice.

- A. The domain of $f \circ g$ is $\{x \mid \underline{\hspace{2cm}}\}$.
(Type an inequality. Use integers or fractions for any numbers in the expression. Use a comma to separate answers as needed.)
- B. The domain of $f \circ g$ is all real numbers.

(b) $(g \circ f)(x) =$ (Simplify your answer.)

Select the correct choice below and fill in any answer boxes within your choice.

- A. The domain of $g \circ f$ is $\{x \mid \underline{\hspace{2cm}}\}$.
(Type an inequality. Use integers or fractions for any numbers in the expression. Use a comma to separate answers as needed.)
- B. The domain of $g \circ f$ is all real numbers.

(c) $(f \circ f)(x) =$ (Simplify your answer.)

Select the correct choice below and fill in any answer boxes within your choice.

- A. The domain of $f \circ f$ is $\{x \mid \underline{\hspace{2cm}}\}$.
(Type an inequality. Use integers or fractions for any numbers in the expression. Use a comma to separate answers as needed.)
- B. The domain of $f \circ f$ is all real numbers.

(d) $(g \circ g)(x) =$ (Simplify your answer.)

Select the correct choice below and fill in any answer boxes within your choice.

- A. The domain of $g \circ g$ is $\{x \mid \underline{\hspace{2cm}}\}$.
(Type an inequality. Use integers or fractions for any numbers in the expression. Use a comma to separate answers as needed.)
- B. The domain of $g \circ g$ is all real numbers.

Answers $18x + 8$

B. The domain of $f \circ g$ is all real numbers.

$18x + 16$

B. The domain of $g \circ f$ is all real numbers.

$81x + 80$

B. The domain of $f \circ f$ is all real numbers.

$4x$

B. The domain of $g \circ g$ is all real numbers.

(33) a $f(x) = 9x + 8$ and $g(x) = 2x$ *inside here*

$$(f \circ g)(x) =$$

$$f(g(x)) =$$

$$f(2x) =$$

$$9(2x) + 8 =$$

$$18x + 8 =$$

domain
 $(-\infty, \infty)$

(33) b $f(x) = 9x + 8$ and $g(x) = 2x$ *inside here*

$$(g \circ f)(x) =$$

$$g(f(x)) =$$

$$g(9x + 8) =$$

$$2(9x + 8) =$$

$$18x + 16 =$$

domain
 $(-\infty, \infty)$

Inside itself

33 c

$f(x) = 9x + 8$ and $g(x) = 2x$

$(f \circ f)(x) =$

$f(f(x)) =$

$f(9x + 8) =$

$9(9x + 8) + 8 =$

$81x + 72 + 8 =$

$81x + 80 =$

domain $(-\infty, \infty)$

Inside itself

33 d

$f(x) = 9x + 8$ and $g(x) = 2x$

$(g \circ g)(x) =$

$g(g(x)) =$

$g(2x) =$

$2(2x) =$

$4x =$

domain $(-\infty, \infty)$

ID: 4.1.23

34. The percentage of patients P who have survived t years after initial diagnosis of a certain disease is modeled by the function $P(t) = 100(0.8)^t$.

$P(1) = 100(0.8)^1$

- (a) According to the model, what percent of patients survive 1 year after initial diagnosis?
- (b) What percent of patients survive 4 years after initial diagnosis?
- (c) Explain the meaning of the base 0.8 in the context of this problem.

$P(1) = 100(0.8)^1$

$P(1) = 100(0.8)^{1(1)}$

$P(1) = 80$

(a) According to the model, % of patients survive 1 year after initial diagnosis.
(Type an integer or a decimal.)

(b) According to the model, % of patients survive 4 years after initial diagnosis.
(Type an integer or a decimal.)

(c) Explain the meaning of the base 0.8 in the context of this problem. Select the correct choice below and fill in the answer box to complete your choice.

$P(1) = 100(0.8)^1$

- A. As each year passes, % of the previous survivors take the diagnosis.
- B. As each year passes, % of the previous year's survivors have survived.
- C. As each year passes, % of the total patients have survived.

$P(4) = 100(0.8)^4$

$P(4) = 100(0.8)^{4(1)}$

$P(4) = 40.96$

Answers 80

40.96

B. As each year passes, % of the previous year's survivors have survived.

Use graphing calculator

ID: 4.3.109

35. The function

$D(h) = 2e^{-0.42h}$

$D(h) = 2e^{-0.42h}$

formula

can be used to find the number of milligrams D of a certain drug that is in a patient's bloodstream h hours after the drug has been administered. How many milligrams will be present after 1 hour? After 4 hours?

After 1 hour, there will be milligrams. (Round to two decimal places as needed.)

After 4 hours, there will be milligrams. (Round to two decimal places as needed.)

Answers 1.31

0.37

$D(1) = 2e^{-0.42(1)}$
2ND LN

$D(1) = 2e^{(-0.42(1))}$

$D(1) = 1.31409364$
2ND LN

Use a graphing calculator

Round $D(1) = 1.31$

ID: 4.3.111

$D(4) = 2e^{(-0.42(4))}$
2ND LN

$D(4) = 0.3727479521$

Round $D(4) = 0.37$

36. Find the amount that results from the given investment.

\$100 invested at 7% compounded quarterly after a period of 3 years

After 3 years, the investment results in \$.
(Round to the nearest cent as needed.)

Answer: 123.14

ID: 4.7.7

$P = \$100$
 $N = 4 = \text{Quarter}$
 $r = 7\% = .07$
 $t = 3 = \text{years}$

Formula
 $A = P(1 + \frac{r}{N})^{Nt}$
 $A = 100(1 + \frac{.07}{4})^{4(3)}$
 $A = 100(1 + .0175)^{12}$
 $A = 100(1.0175)^{12}$
 $A = 123.1439315$
 $A = 123.14$ *Round*

37. Solve the system of equations. If the system has no solution, say that it is inconsistent.

$$\begin{cases} 4x - 2y = 8 \\ 5x + y = 24 \end{cases}$$

Select the correct choice below and, if necessary, fill in any answer boxes within your choice.

- A. The solution of the system is $x =$ and $y =$.
(Type an integers or simplified fractions.)
- B. There are infinitely many solutions. Using ordered pairs, the solution can be written as $\{(x,y) | x =$, $y \text{ any real number}\}$.
(Simplify your answer. Type an expression using y as the variable as needed.)
- C. The system is inconsistent.

Answer: A. The solution of the system is $x =$ and $y =$.
(Type an integers or simplified fractions.)

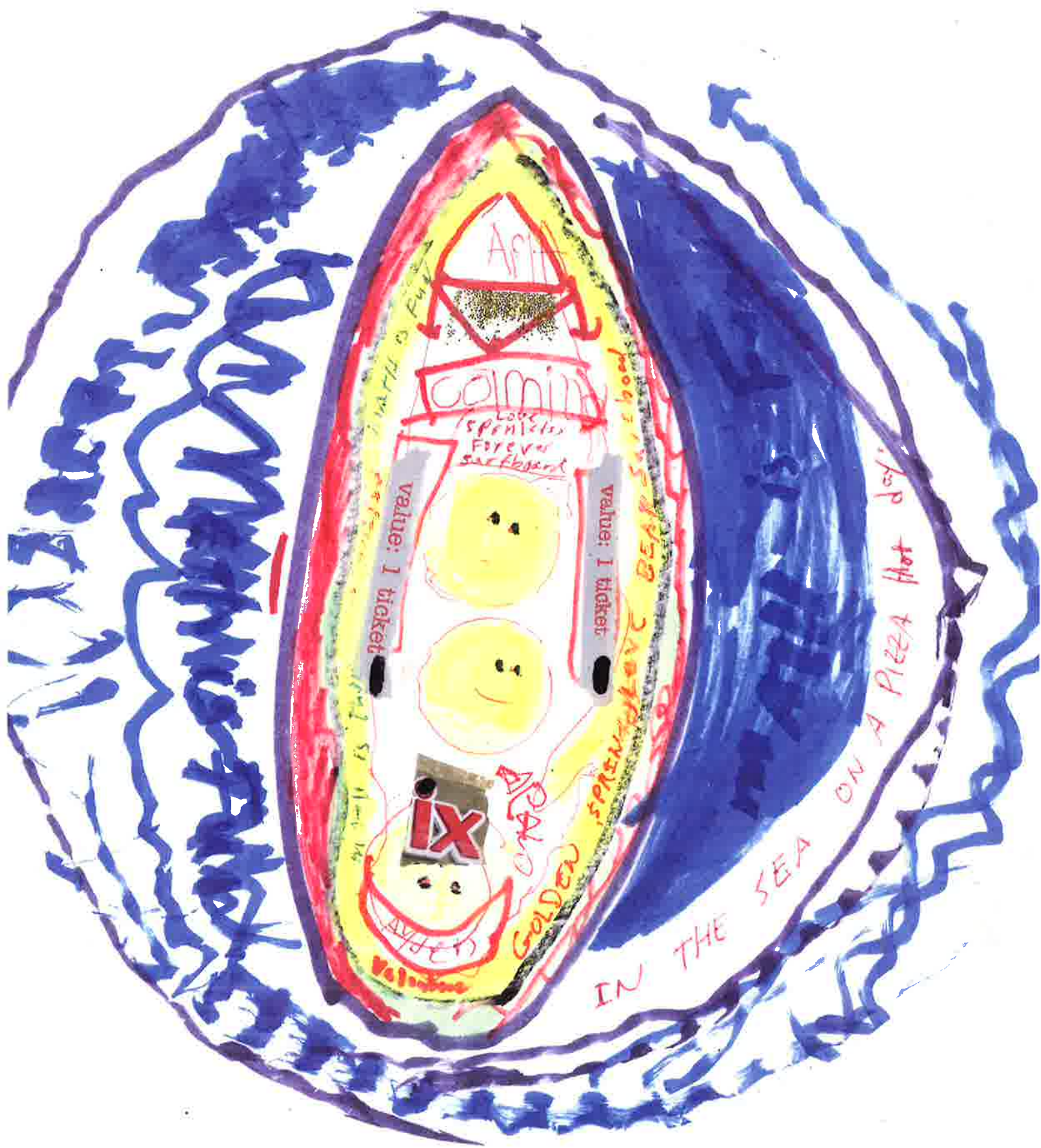
ID: 6.1.33

Mult
 $\begin{pmatrix} 4x - 2y = 8 & (1) \\ 5x + 1y = 24 & (2) \end{pmatrix} \times$

$4x - 2y = 8$
 $10x + 2y = 48$

 $14x + 0 = 56$
 $14x = 56$
 $\frac{14x}{14} = \frac{56}{14}$
 $x = 4$

Subst
 $4x - 2y = 8$
 $4(4) - 2y = 8$
 $16 - 2y = 8$
 $16 - 2y - 16 = 8 - 16$
 $-2y = -8$
 $\frac{-2y}{-2} = \frac{-8}{-2}$
 $y = 4$
 $(x, y) = (4, 4)$



AFT

Comin

Love
spenies
Firever
sackboard

value: 1 ticket

value: 1 ticket

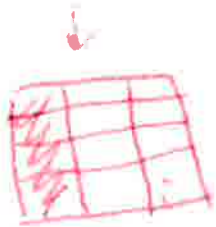


Golden

IN THE SEA ON A PIZZA Hot day.



$$\frac{1}{3} \times \frac{4}{4} = \frac{4}{12}, \quad \frac{2}{4} \times \frac{3}{3} = \frac{6}{12}$$



SMART Bird 5-20-17
AMIL

MATH IS
FUN

$$\frac{4}{12} + \frac{6}{12} = \frac{10}{12} = \frac{5}{6}$$

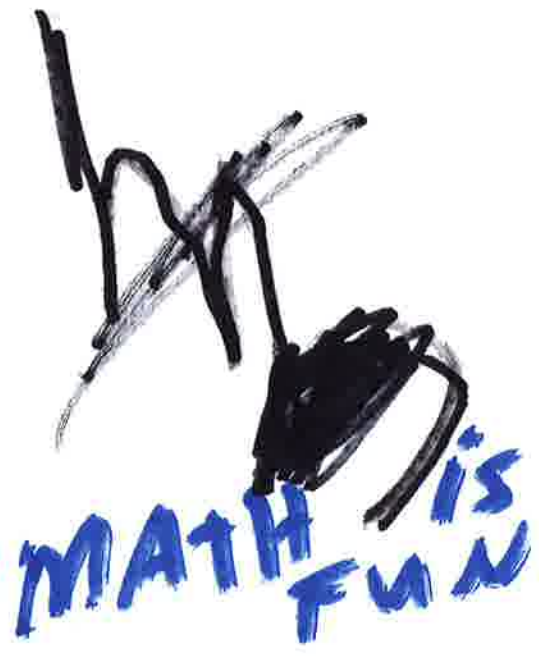
$$\frac{12}{12} - \frac{10}{12} = \frac{2}{12} \text{ or } \frac{1}{6}$$

Mari Mari Mari

BROKEN SURFBOARD



121119.AFL





MATH

MATH

MATH is Fun

(exponential growth)

